

Abstract Submitted  
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**Hugoniot measurements for tantalum up to impact velocity of  $\sim 10$  km/s on a three-stage gun** JIANBO HU, HUA TAN, CHENGDA DAI, XIANG WANG, JINSONG BO, YUN MA, QINGSONG WANG, GUOQIANG LUO, QIANG SHEN, LSD TEAM, NMLAB, WUHANTECH TEAM — A “three-stage gun” was developed at LSD by mounting an accelerating tube on a two-stage gun. A Ta flyer (32 mm diameter by 0.5 mm thick) was driven by a graded-density impactor (GDI) up to  $\sim 9.61$  km/s for Hugoniot measurements. The velocity of the Ta flyer was measured using a Doppler probe system, or determined from 1D hydrodynamic code calculations based on the projectile velocity measured by using optical beam break technique. The incident and transmitted time of shock front through the Ta specimen was detected by electric shorting-pins. The Hugoniot states of Ta specimen were determined using impedance-match method. The preheating effect resulting from the GDI driving on the Ta flyer was estimated by model calculations. Two data pairs of shock velocity versus particle velocity were obtained and consistent with the extrapolation of reported data.

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